

DIRECT TESTIMONY
OF
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ENERGY DIVISION—POLICY PROGRAM
ILLINOIS COMMERCE COMMISSION

PETITION FOR APPROVAL OF AN ALTERNATIVE RATE REGULATION PLAN PURSUANT TO SECTION 9-
244 OF THE PUBLIC UTILITIES ACT

COMMONWEALTH EDISON COMPANY

DOCKET No. 10-0527

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1 **I. Witness Qualifications**

2 **Q. What is your name and business address?**

3 A. My name is Jennifer L. Hinman. My business address is Illinois Commerce
4 Commission, 527 East Capitol Avenue, Springfield, Illinois 62701.

5 **Q. By whom and in what position are you employed?**

6 A. I am employed as an Economic Analyst in the Energy Division's Policy Program
7 under the Bureau of Public Utilities at the Illinois Commerce Commission ("ICC"
8 or "Commission").

9 **Q. What are your responsibilities within the Energy Division's Policy
10 Program?**

11 A. I provide testimony in Commission proceedings on behalf of the Staff of the
12 Commission ("Staff"). I monitor, review, and analyze utility and party filings in
13 docketed Commission cases. I identify and initiate discovery to support research
14 into economic policy issues.

15 **Q. Describe your educational background.**

16 A. In May of 2010, I graduated from Illinois State University with a Master of
17 Science degree in Applied Economics with a specialization in the Electricity,
18 Natural Gas, and Telecommunications Economics Regulatory sequence.
19 In May of 2004, I earned a Bachelor of Arts degree in Economics with a Financial
20 Certificate and graduated summa cum laude from the University Honors Program
21 at Armstrong Atlantic State University in Savannah, Georgia.

22 **Q. Describe your professional experience.**

23 A. Since April of 2010, I have been employed as an Economic Analyst in the Policy
24 Program of the Commission's Energy Division. While employed by the
25 Commission, I have been involved in energy efficiency and electric vehicle
26 related issues among other topics, and have provided testimony on behalf of the
27 Commission at an Illinois Senate Energy Committee Hearing regarding the ICC's
28 Plug-in Electric Vehicle Policy Initiative.

29 While attending Illinois State University from August of 2008 through May of
30 2010, I worked as a full-time Graduate Assistant to Dr. David Loomis in the
31 Applied Economics Department.

32 During summer of 2009, I was an intern in the Regulatory Department at AT&T
33 Illinois in Chicago. During my time at AT&T, I analyzed, compiled, graphed, and
34 provided detailed recommendations on AT&T Illinois' Alternative Regulation Plan
35 on individual service margins. In addition, I reviewed the tariffing process and
36 filed wholesale tariffs.

37 **II. Purpose of Testimony and General Conclusions**

38 **Q. What is the subject matter of this proceeding?**

39 A. This case concerns the filing by Commonwealth Edison Company ("ComEd" or
40 "Company") of an Alternative Regulation ("Alt Reg") Plan which seeks, among
41 other things, to place into effect the Accelerated Customer Enhancements Pilot
42 ("Rate ACEP") tariff, pursuant to Section 9-244 of the Illinois Public Utilities Act
43 ("PUA" or "Act") (220 ILCS 5/9-244).

44 **Q. What is the purpose of your direct testimony in this proceeding?**

45 The purpose of my testimony is to provide an analysis of the Company's proposed
46 Electric Vehicle ("EV") Pilot program in terms of its proposed budget and the
47 purported customer benefits of the program.

48 **Q. What conclusions have you reached?**

49 A. I find that the budget proposed by ComEd is not as fully specified as might have
50 been expected at first glance. Upon doing an independent investigation including
51 receiving additional information based on data request responses; I find the budget
52 contains several items that appear to be overpriced.

53 Additionally, I find the purported informational benefits ascribed to the program to
54 be poorly specified and of questionable value.

55 **III. Analysis of the Proposed Electric Vehicle Pilot Program**

56 **A. Concerns About Employing a Budget for the Alt Reg Incentive**
57 **Program in General and the EV Pilot in Particular**

58 **Q. Are you concerned about using a budget for an Alt Reg incentive program?**

59 A. Yes. The Company has every incentive¹ to inflate the budget proposed to the
60 Commission to stay far enough under budget to complete the program and thereby
61 profit substantially. Ratepayers would be harmed by these inflated budgets
62 because they would have to pay the resulting higher rates.

¹ Dr. David Rearden's direct testimony addresses the Company's incentives under the Alt Reg proposal in ICC Staff Ex. 1.0.

63 **Q. Are these flaws manifested in the proposed EV program?**

64 A. Yes. My analysis, as discussed further below, reveals several weaknesses
65 associated with the proposed EV Pilot program's budget, cost estimates, ratepayer
66 benefits, and uncertainty regarding ComEd's actions in carrying out the program.
67 Despite the fact that at first glance the EV Pilot program seems to be reasonably
68 well specified as compared with other proposed Alt Reg programs, upon
69 investigation, the budgeted amounts are drawn into substantial question.

70 **B. Overview of the Proposed Electric Vehicle Pilot Program**

71 **Q. Please describe the proposed Electric Vehicle Pilot Program.**

72 A. ComEd proposes to invest \$5 million in EVs for its utility vehicle fleet and
73 associated charging stations. Of that total, Company witness Mr. McMahan states
74 that \$4.43 million is allocated to the distribution function and, therefore, identified as
75 ICC-jurisdictional based on ComEd's current approach to jurisdictional splits of
76 transmission and distribution in its current rate case, Docket No. 10-0467 (ComEd
77 Ex. 2.0 at 4:79-83). ComEd has requested that the Commission authorize this
78 investment and provide for its recovery as discussed by Dr. Hemphill (ComEd Ex.
79 1.0). ComEd is proposing the purchase of the following assets with the unit cost
80 estimates forming a basis for Commission approval of its proposed budgeted
81 amount, as seen in the table below.

82

83

ComEd EV Pilot Program Assets	Unit Cost	Quantity	Total ComEd Cost
Plug-in car	\$ 36,000	45	\$ 1,620,000
Plug-in cargo/service vehicle	\$ 135,000	8	\$ 1,080,000
Hybrid bucket truck (non-pluggable)	\$ 250,000	4	\$ 1,000,000
PHEV digger-derrick	\$ 350,000	2	\$ 700,000
Level 2 charging stations for company vehicles	\$ 10,000	55	\$ 550,000
Incidental equipment and contingency	\$ 50,000		\$ 50,000
Total Vehicles:		59	
Total Charging Stations:		55	
Total EV Pilot Program Investment:			\$ 5,000,000

84 (ComEd Ex. 2.0 at 5:86)

85 **Q. During the Biennial Review Proceeding called for by Section 9-244(c) of the**
86 **PUA, what EV Pilot program objectives are proposed by ComEd for the**
87 **Commission's review?**

88 **A.** ComEd described the EV Pilot program's objectives in its response to Staff Data
89 Request JLH 2.02. ComEd states:

90 The EV pilot will study EVs' operational, economic, and
91 environmental costs and benefits, and assess EVs' ability to
92 replace carbon-fueled vehicles in the utility fleet. The objective is to
93 fulfill this program within the proposed \$5 million budget.
94

95 **C. The Electric Vehicle Pilot Budget**

96 **Q. Please list the manufacturers for the assets that ComEd proposes to**
97 **purchase as part of ComEd's EV Pilot Program.**

98 **A.** Plug-in car: Nissan Leaf

- 99 Plug-in cargo/service vehicle: Navistar eStar
- 100 Hybrid bucket truck: International chassis with Eaton hybrid drive system and Altec
- 101 TA40 aerial equipment
- 102 PHEV digger derrick: IHC chassis with DUECO C4047 plug-in hybrid digger derrick
- 103 Coulomb Technologies CT 2100 Level 2 charging station
- 104 (ComEd Response to Staff Data Request JLH 1.09b)

105 **Q. Has the Company provided any sources for its cost estimates?**

106 A. The Company provided the information presented in the table below:

Vehicle Costs	Cost p.u.	Quantity	Total Cost
Plug-in Car			
Price based on Nissan Leaf cost estimate	\$ 36,000	45	\$ 1,620,000
Plug-in Cargo/Service Vehicle			
Price based on Navistar eStar cost estimate	\$135,000	8	\$ 1,080,000
Hybrid Bucket Truck (non-pluggable)			
Price based on existing cost for hybrid bucket truck	\$250,000	4	\$ 1,000,000
PHEV Digger Derrick Truck			
Price based on cost of Dueco PHEV digger derrick	\$350,000	2	\$ 700,000
			Total Cost
TOTAL VEHICLE COSTS		59	\$ 4,400,000
Charging Infrastructure Costs	Cost p.u.	Quantity	Total Cost
Level 2 Charging Station			
Coulomb Technologies Smart Charging station	\$ 5,000		
Installation (labor, material)	\$ 5,000		
Charging Stations for ComEd plug-in vehicles			
Total equipment costs per charge point	\$ 10,000	55	\$ 550,000
Incidental equipment and contingency			
Contingency for <i>unforeseen installation</i> costs			\$ 50,000
			Total Cost
TOTAL PROJECT COSTS			\$ 5,000,000

107 (ComEd Response to Staff Data Request JLH 1.09_Attach 1)

108 **Q. Have you investigated the prices for any of these items?**

109 A. Yes, I have. The Company currently owns assets similar to those being proposed.

110 **Q. What assets does ComEd have that are similar to those being proposed**
 111 **under the EV Pilot?**

112 A. ComEd currently owns nine (9) hybrid electric bucket trucks and ten (10) converted
 113 plug-in hybrid electric vehicles (ComEd Response to Staff Data Request JLH
 114 1.10a).

115 **Q. Is ComEd proposing to purchase any vehicles that are of the same model**
 116 **and type as ComEd already owns?**

117 A. Yes. In particular, the four (4) hybrid bucket trucks: International chassis with Eaton
 118 hybrid drive system and Altec TA40 aerial equipment. ComEd has budgeted
 119 \$250,000 each for the hybrid bucket trucks. Below is a table showing the prices that
 120 ComEd paid for vehicles of this type back in 2009.²

Order Date	Invoice Date	Company	Model	Price	Price + Taxes+Title	ComEd Truck #	Invoice #
Chassis	4/23/2009	International	2010 Model 4300	\$114,353	\$123,988	649164	33083
Aerial	3/6/2009	Altec	TA40 fully configured FA model	\$85,272	\$90,602	649164	8087284
				\$199,625	\$214,590		
Chassis	4/23/2009	International	2010 Model 4300	\$114,353	\$123,988	649165	33084
Aerial	3/6/2009	Altec	TA40 fully configured FA model	\$85,727	\$91,085	649165	8087442
				\$200,080	\$215,073		
Chassis	4/23/2009	International	2010 Model 4300	\$114,353	\$123,988	649166	33085
Aerial	3/6/2009	Altec	TA40 fully configured FA model	\$85,272	\$90,602	649166	8087283
				\$199,625	\$214,590		
Chassis	4/23/2009	International	2010 Model 4300	\$114,353	\$123,988	649167	33086
Aerial	3/6/2009	Altec	TA40 fully configured FA model	\$85,272	\$90,602	649167	8087450
				\$199,625	\$214,590		

121
 122 **Q. Do you believe that the projected costs for hybrid bucket trucks in the budget**
 123 **should reflect their 2009 prices?**

124 A. Not necessarily. These costs reflect what ComEd paid for the vehicles and even
 125 current list prices of these vehicles were not available to me.³ The exact model of
 126 the hybrid bucket truck that ComEd is proposing as part of the EV Pilot cost

² Data in table generated from ComEd Response to Staff Data Request JLH 1.10_Attach 1.

³ The manufacturers' websites have the prices of new vehicles protected such that only members/previous customers can view the prices.

ComEd between \$214,589.50 and \$215,072.94 including taxes and title in 2009 (*Id.*). ComEd estimates the unit cost for a generic hybrid bucket truck equals \$250,000 in its budget. Thus, there is roughly a \$140,000 [$=(\$[Price\ in\ Budget] - \$215,000) \times 4$] difference⁴ in terms of just the hybrid bucket trucks in the EV Pilot budget. However, it is conceivable that hybrid electric bucket truck prices have risen or fallen since 2009. This demonstrates another weakness of the Company's proposal: it is difficult, at best, to evaluate a budget that is to be used as a standard for measuring performance.

Q. How did the costs of the other hybrid bucket truck models compare with the model the Company is proposing?

A. Below is a table showing the other prices of the hybrid bucket trucks that ComEd has purchased over the years.⁵ As can be seen, the range in price varies with time and model number.

	Order Date	Invoice Date	Company	Model	Price	Price + Taxes+Title	ComEd Truck #	Invoice #
Chassis		11/30/2005	International	2006 Model 4300 SBA 4X2	\$106,885	\$114,853	649133	12582
Aerial	4/26/2005	4/28/2006	Altec	TA45	\$62,385	\$66,284	649133	8041863
					\$169,270	\$181,138		
Chassis		12/19/2008	International	2009 Model 4300 Cab and Chassis			899326	4364456
Aerial		12/19/2008	Altec	TA50			899326	4364456
				Purchased from Global Rental Co., Inc. (partner of Altec)	\$197,000	\$213,122		
Chassis		4/23/2009	International	2010 Model 4300	\$116,341	\$126,120	899327	33081
Aerial	3/4/2009	7/30/2009	Altec	TA45M fully configured FA model (2010)	\$85,424	\$90,763	899327	8086841
					\$201,765	\$216,883		
Chassis		4/23/2009	International	2010 Model 4300	\$116,341	\$126,120	899328	33082
Aerial	3/4/2009	7/30/2009	Altec	TA45M fully configured FA model (2010)	\$85,424	\$90,763	899328	8086842
					\$201,765	\$216,883		
Chassis		4/23/2009	International	2010 Model 4300	\$116,341	\$126,120	899329	33080
Aerial	3/7/2009	8/31/2009	Altec	TA50 non configured FA model	\$131,763	\$139,998	649169	8087449
					\$248,104	\$266,118		

The minimum cost of a hybrid bucket truck was \$181,138 (*Id.*). The most expensive hybrid bucket truck purchased by ComEd cost \$266,118, but it

⁴ This results in roughly a \$35,000 difference in cost per vehicle, which is enough money to purchase an extra electric vehicle.

⁵ Data in table generated from ComEd Response to Staff Data Request JLH 1.10_Attach 1.

143 included the Altec TA50 aerial equipment as opposed to the Altec TA40 aerial
144 equipment. Thus, details such as model numbers and technical specifications
145 that are missing from the proposed budgets may have significant impacts on
146 ComEd's final investment expenditure amounts. ComEd appears to be able to
147 choose to complete a program under budget, especially if it overestimates the
148 cost to purchase assets and ends up purchasing different cheaper models.

149 **Q. Why do these differences in price based on time and model number matter?**

150 A. It is very difficult to accurately evaluate the future costs of items when the cost
151 estimates are used as benchmarks. Different models and manufacturers of virtually
152 the same type of vehicle have significant differences in costs.

153 When the monetary incentive is tied to a budget, the Company will have an
154 incentive to spend under budget. The more inflated the budget, the greater the
155 profit opportunities are, and the more likely it is that ratepayers will be paying higher
156 rates under the Alt Reg mechanism than they would otherwise pay under traditional
157 rate of return regulation.

158 **Q. Has ComEd purchased alternative fueled vehicles⁶ (AFV) and put them in rate**
159 **base under traditional rate of return regulation?**

160 A. Yes. A hybrid bucket truck that was put in service in 2006 is currently in rate base
161 (ComEd Response to Staff Data Request JLH 1.10b). In addition, ComEd's website
162 states that its green fleet is currently comprised of the following vehicles:⁷

⁶ ComEd defines an Alternative-Fuel Vehicle as "Any vehicle fully or partly powered by an energy source other than 100% petroleum." <<https://www.comed.com/sites/Environment/Pages/greenvehicles.aspx>>

⁷ <https://www.comed.com/sites/Environment/Pages/greenvehicles_fleetdetails.aspx> (11-10-10)

163 1,774 trucks that use biodiesel fuel (20% soybean oil, 80% diesel)
164 250 E85 flex-fuel vehicles capable of being fueled with ethanol
165 91 hybrid Ford Escape SUVs
166 40 Prius hybrids
167 10 Prius Plug-in hybrid electrical vehicles (PHEV)
168 2 biodiesel-electric hybrid bucket truck
169 1 liquid petroleum gas (LPG) bucket truck
170 Alternative-fuel vehicles represent 63 percent of ComEd's total fleet
171 of cars and trucks.

172 Thus, it appears that ComEd has not needed an Alt Reg incentive mechanism in
173 order to deploy alternative fueled vehicles on a widespread basis. This is contrary
174 to Mr. McMahan's statement that ComEd "cannot prudently deploy them on a
175 widespread basis without first piloting them" (ComEd Ex. 2.0 at 3:60-61).

176 **Q. Are there any vehicles similar to those proposed in ComEd's EV Pilot that are**
177 **proposed to be included in rate base in ComEd's current rate case in Docket**
178 **No. 10-0467?**

179 A. Yes, ComEd has proposed to include eight (8) hybrid electric bucket trucks and ten
180 (10) plug-in hybrid electric vehicles in rate base (ComEd Response to Staff Data
181 Request JLH 1.10b).

182 **Q. Has ComEd installed charging stations for the plug-in electric vehicles that it**
183 **currently owns?**

184 A. No. The ten (10) 2009 Toyota Prius plug-in hybrid electric vehicles use standard
185 120 volt (V), 20 ampere outlets for charging a 5 kilowatt-hour (kWh) battery, which
186 takes a maximum of 3.5 hours to charge. In addition, no distribution system
187 upgrades were necessary to accommodate the additional load from these vehicles
188 (ComEd Response to Staff Data Request JLH 1.10d and 1.10e).

Q. The Company stated that it intends to purchase Nissan Leafs; has Nissan announced the price it intends to charge for the Leaf?

A. Yes. The Manufacturer Suggested Retail Price (MSRP) is \$32,780,⁸ and if the federal tax credit of \$7,500 is still available, the buyer's net price could be as low as \$25,280.⁹ Thus, the plug-in car component of the budget may be inflated by almost \$500,000. More precisely, it is inflated by \$482,400 [= (\$[Price in Budget] — \$25,280)*45]¹⁰. It should be recognized that this estimate is based on the MSRP for a single vehicle. My understanding as a consumer is that discounts from the MSRP are typically available as are fleet discounts for purchase of multiple vehicles. These factors tend to make the almost \$500,000 overstatement of cost conservative.

Q. If the federal tax credit of \$7,500 is still available when and if the electric vehicles are purchased, how does ComEd intend to account for the tax credit in Rate ACEP?

A. Currently, ComEd is not making any provision for these tax credits in Rate ACEP. This \$7,500 tax credit would potentially apply to the plug-in cars and plug-in cargo/service vehicles shown in the ComEd EV Pilot Program Assets table presented on line 86 of page 5 of Company witness, Mr. McMahan's testimony (ComEd Ex. 2.0). In addition, it is possible that state tax credits or incentives for

⁸ At an 8% sales tax rate, the unit cost increases to \$35,402. Assuming the cost of the car title is \$150, the unit cost estimate increases to \$35,552 (these assumptions were based on rough estimations from the Prius invoices provided in ComEd Response to Staff Data Request JLH 1.10_Attach 1).

⁹ Assuming an 8% sales tax rate and a car title cost of \$150, the buyer's net price could be as low as \$28,052

¹⁰ Assuming an 8% sales tax rate and a car title cost of \$150, the budget is inflated by \$357,660 [=45*(\$[Price in Budget] — \$28,052)] just from the plug-in car portion of the program.

208 fleets of alternative fueled vehicles become available. For example, the “Illinois
209 Alternate Fuels Rebate Program provides a rebate for 80% of the incremental cost
210 of purchasing an AFV (up to \$4,000), 80% of the cost of federally certified AFV
211 conversions (up to \$4,000), and for the incremental cost of purchasing alternative
212 fuels.”¹¹

213 In its corrected response to Staff Data Request JLH 1.08b, ComEd states:

214 ComEd would be receptive to a proposal in Staff’s direct testimony
215 that recommends including provisions in Rate ACEP – Accelerated
216 Customer Enhancements Pilot (Rate ACEP) to recover any
217 operations and maintenance (O&M) expenses related to the EV
218 Pilot program, which would then be offset by any applicable tax
219 credits that become available and that ComEd receives.

220 Staff witness Ms. Dianna Hathhorn’s direct testimony addresses this proposal in
221 ICC Staff Exhibit 5.0.

222 **Q. How does ComEd propose to charge its Nissan Leafs?**

223 A. The Nissan Leaf has a 24 kWh lithium-ion battery. According to Nissan’s website,¹²
224 it comes with a 120 V portable trickle charging cable as standard equipment, but
225 Nissan recommends a Home Charging Dock (240 V). Starting from a depleted
226 battery, the Nissan Leaf takes less than 20 hours to charge using a standard 120 V
227 outlet. However, ComEd is proposing to use a level 2 charging station¹³ (220/240
228 V), that requires less than 8 hours to completely charge the Leaf. ComEd is
229 budgeting \$5,000 for the charger and \$5,000 for its installation per charger in
230 addition to a \$50,000 reserve account for unforeseen installation costs

¹¹ <<http://www.afdc.energy.gov/afdc/laws/laws/IL/tech/3270>>

¹² <<http://www.nissanusa.com/>>

¹³ Electric vehicle charging stations are also known as Electric Vehicle Supply Equipment (EVSE).

(approximately \$909 [= \$50,000/55 stations] per charging station). In addition, ComEd chose Coulomb Technologies CT 2100 charging stations that include one level 2 connection per port. ComEd chose this charging station for “its ability to be networked and remote communications capability, enabling aggregate management of the electrical load associated with ComEd’s fleet of plug-in vehicles” (ComEd Response to Staff Data Request JLH 1.09).

Q. Have you investigated the prices for level 2 charging stations?

A. Yes, I have and a level 2 charger can be purchased for less than \$500 before taxes. For example, the residential Voltec™ Charge Station is priced at \$490.¹⁴ Thus, from the way this Alt Reg plan is structured, ComEd could purchase 55 of the cheaper charging stations and come in significantly under budget, approximately \$245,850 [= (\$5,000 — \$530¹⁵)*55] just for the charging station portion of the budget (excluding the installation costs). However, the cheaper stations have fewer functionalities in terms of load management. This would not appear to be a great concern because the Company likely would be charging the cars in the evening and/or early morning minimizing any load management concerns. Thus, ratepayers could be required to pay an incentive return on half the difference between ComEd’s budgeted amount and the price of cheaper units due to the incentive component of Rate ACEP. However, it is unclear exactly how the Company will determine when the EV Pilot program is complete (and a final

¹⁴ <<https://www.homecharging.spx.com/volt/Display.aspx?id=7&menu=14>> This does not include installation cost.

¹⁵ Assuming an 8% sales tax rate.

251 investment expenditure amount is determined), and thus the incentive component
252 of Rate ACEP would be calculated. ComEd states:

253 The cost of the assets purchased in association with an approved
254 program will be reflected in the final investment expenditure amount
255 for the program. A simple quantitative assessment of the assets
256 purchased or installed may not be the only criterion that should be
257 used to determine when a program is concluded and for which a
258 final investment expenditure amount should be determined.

259 (ComEd Response to Staff Data Request JLH 2.03d)

260 **Q. Are tax incentives available for charging station costs?**

261 A. Yes. In response to Staff Data Request JLH 1.08a, ComEd comments on potential
262 tax credits associated with the electric vehicle charging infrastructure costs where it
263 states:

264 The Alternative Fuel Vehicle Refueling Property Credit (IRS Form
265 8911) currently allows a rebate of 50% (up to \$50,000) of vehicle
266 charging infrastructure costs. However, the current tax credit
267 expires 12/31/2010 and it is not known at this time whether or not
268 the tax credit will be extended.

269 **Q. How do you respond to ComEd's response?**

270 A. By waiting until the Alt Reg case is done to purchase the chargers, ComEd may be
271 foregoing cost savings of \$137,500 $[(\$5,000/2)*55]$ that would have been
272 available with a purchase of the chargers this year under traditional regulation. A
273 similar concern could be offered for the vehicles themselves and the possible loss
274 of the \$7,500 per vehicle federal tax credit. Putting the two together would mean
275 that \$535,000 in cost savings may be jeopardized by ComEd having not procured
276 the vehicles and stations this year under a traditional regulatory regime.

277 **Q. Have you investigated the installation costs for level 2 charging stations?**

278 A. Yes. A U.S. Department of Energy Study¹⁶ completed in November of 2008
 279 provides an estimate of the costs for level 2 charging stations in addition to the
 280 installation costs in a variety of settings:

Table 6-2. Infrastructure costs for Level 2 residential charging.

Level 2 Residential	Labor	Material	Permits	Total
EVSE (32 A wall box)	--	\$650	--	\$650
EVSE (charge cord)	--	\$200	--	\$200
Residential circuit installation(40A branch circuit, 240 VAC/1-Phase)	\$455	\$470	\$155	\$1,080
Administration costs	\$91	\$94	\$31	\$216
Total Level 2 Cost	\$546	\$1,414	\$186	\$2,146

Table 6-4. Infrastructure costs for Level 2 apartment complex charging.

Level 2 Apartment	Labor	Material	Permits	Signage	Total
EVSE (five 32A wall boxes)	--	\$3,250	--	--	\$3,250
EVSE (five charge cords)	--	\$1,000	--	--	\$1,000
Apartment complex circuit installation (five, 40A branch circuits, 240 VAC/1-Phase with separate breaker panel)	\$1,400	\$696	\$165	\$350	\$2,611
Administration costs	\$280	\$353	\$33	\$70	\$736
Total Level 2 Cost	\$1,680	\$5,299	\$198	\$420	\$7,597
Total per Charger Cost	\$336	\$1,060	\$40	\$84	\$1,520

¹⁶ Morrow, Kevin, Donald Karner, and James Francfort. November 2008. U.S. Department of Energy Vehicle Technologies Program – Advanced Vehicle Testing Activity Plug-in Hybrid Electric Vehicle Charging Infrastructure Review Final Report, Battelle Energy Alliance Contract No. 58517. Prepared for the U.S. Department of Energy Assistant Secretary for Energy Efficiency and Renewable Energy Under DOE Idaho Operations Office, Contract DE-AC07-05ID14517.
<http://avt.inel.gov/pdf/phev/phevInfrastructureReport08.pdf>

Table 6-5. Infrastructure costs for Level 2 commercial facility charging.

Level 2 Commercial	Labor	Material	Permits	Signage	Total
EVSE (ten 32A wall boxes)	--	\$6,500	--	--	\$6,500
EVSE (ten charge cords)	--	\$2,000	--	--	\$2,000
Apartment complex circuit installation (ten, 40A branch circuits, 240 VAC/1-Phase with separate meter and breaker panel)	\$3,400	\$3,899	\$700	\$350	\$8349
Administration costs	\$680	\$780	\$140	\$70	\$1,670
Total Level 2 cost	\$4,080	\$13,179	\$840	\$420	\$18,519
Total per Charger Cost	\$408	\$1,318	\$84	\$42	\$1,852

(Morrow et al., 2008, at 31-32).

The table shows that depending on the number of vehicles to be charged simultaneously per station, the costs per charge point (including the charging station (EVSE) and installation costs) changes significantly from \$1,520 for a 5-vehicle station, \$1,852 for a 10-vehicle commercial facility charging station, to as high as \$2,146 for a single vehicle residential charger, all significantly less than the \$10,000 per charge point budgeted by ComEd. Thus, from the way this Alt Reg plan is structured, it is possible that ComEd could purchase and install charging stations significantly under budget. Based on the estimates above, at a lower cost of approximately \$448,140 $[(\$10,000 - \$1,852) \times 55]$ for the charging station and installation portion of the budget. I am not aware of any significant changes that have occurred since 2008 that would increase the installation costs of level 2 charging stations. Thus, the installation costs in ComEd's budget may be significantly inflated, though the installation costs are highly dependent on a variety of factors, including location. An installation cost of \$5,000 per charging station (closer to \$6,000 if the costs of incidental equipment and contingency are allocated

evenly across the stations) seems greatly exaggerated, according to the information available publicly.

Q. Is the \$10,000 per charger cost reasonable?

A. In response to Staff Data Request JLH 1.09, ComEd provided the following information:

Charging Infrastructure Costs		
Level 2 Charging Station	Cost p.u.	
Coulomb Technologies Smart Charging station	\$	5,000
Installation (labor, material)	\$	5,000
Total equipment costs per charge point	\$	10,000
	Quantity	Total Cost
Charging Stations for ComEd plug-in vehicles	55	\$ 550,000
Incidental equipment and contingency		\$ 50,000
Contingency for unforeseen installation costs		
Total Charging Station Costs		\$ 600,000

(ComEd Response to Staff Data Request JLH 1.09_Attach 1)

ComEd additionally stated the following:

Deployment locations for plug-in vehicles and the associated charging infrastructure have not been finalized. All locations will be at ComEd facilities and for the sole use of ComEd vehicles. No permitting costs are included in the estimated costs for the charging stations. Installation costs will vary by location based on existing electrical infrastructure, number of charging stations deployed at the site, and any service upgrades needed. Locations will be selected in order to optimize the balance between installation costs and vehicle deployment benefits. The company expects to utilize one or more of its facilities contractors of choice to perform the installations. Expected distribution system upgrades are not known at this time, and will be dependant on the locations selected for deployment of the EVs and the associated infrastructure. However, required upgrades will be one of the criteria used to select deployment locations. Expected costs of electricity to charge the EVs are not bundled into the charging station costs or EV costs, and have not been calculated at this time. ComEd anticipates utilizing its Fleet Services employees to conduct monthly visual inspections of the charging stations for signs of physical damage or wear. The cost of safety inspections is not bundled into the unit cost of the charging stations. The charging stations include a 3-year

328 warranty. While charging stations will be designated for specific
329 ComEd plug-in vehicles, they may be used occasionally by other
330 ComEd vehicles, such as those traveling between ComEd regions.
331 It is not anticipated that these charging stations will be made
332 available for public or personal employee use.

333 (ComEd Response to Staff Data Request JLH 1.09)

334 ComEd does not justify the need to network the charging stations and the need for
335 remote communications capability to enable aggregate management of the
336 electrical load associated with ComEd's fleet of plug-in vehicles.

337 **Q. What is your conclusion from your evaluation of the budgeted cost of the EV**
338 **Pilot program?**

339 A. ComEd's plans for the EV Pilot consist of a number of uncertainties, e.g., the
340 number of charging stations per location, the locations for the charging stations,
341 and the distribution upgrades are all unknown. This exacerbates the issue of trying
342 to determine a budget that is the standard against which Company performance
343 would be determined. In doing so, it challenges the proposition that ratepayers
344 would benefit from this program being pursued under ComEd's proposed Alt Reg
345 program.

346 **Q. Please summarize your findings with respect to the budget for the EV Pilot**
347 **program.**

348 A. The proposed budget for the EV Pilot appears to have inflated unit cost estimates,
349 which unnecessarily could raise rates unnecessarily for ComEd's ratepayers. And
350 because those prices, rates would increase for the EV Pilot more under Rate ACEP
351 than they otherwise would under traditional rate of return regulation for the services

covered by the program. By doing some rough cost calculations based on publically available data, I estimate that the EV Pilot budget is inflated by over \$1 million. The table below lists the items in ComEd's budget and compares ComEd's values to mine.

ComEd EV Pilot Program Assets	Budgeted Unit Cost	Quantity	ComEd Budgeted Cost	Potentially Inflated by:
Plug-in car	\$ 36,000	45	\$ 1,620,000	\$ 482,400
Plug-in cargo/service vehicle	\$ 135,000	8	\$ 1,080,000	?
Hybrid bucket truck (non-pluggable)	\$ 250,000	4	\$ 1,000,000	\$ 140,000
PHEV digger-derrick	\$ 350,000	2	\$ 700,000	?
Level 2 charging stations for company vehicles	\$ 10,000	55	\$ 550,000	\$ 448,140
Incidental equipment and contingency	\$ 50,000		\$ 50,000	\$ 50,000
Total Vehicles:		59		
Total Charging Stations:		55		
Total EV Pilot Program Investment:			\$ 5,000,000	\$ 1,120,520

Q. Would ComEd accepting the lower estimated values you describe above, eliminate your concerns about the budget estimates?

A. No. While the lower values may be more reasonable, it does not solve the intractable problem of providing a fair budget to tie an Alt Reg program to. ComEd may be aware of price discounts that may be available to it. Such discounts would reward ComEd not for superior efficiency, but rather for its superior knowledge based on its being a participant in the market. This knowledge contrasts with an analyst looking from the outside using public data and without the same access to market participants.

D. Benefits of the Electric Vehicle Pilot to Ratepayers

Q. ComEd witness Mr. McMahan states that the proposed EV Pilot “will provide knowledge of EV lifecycle costs and operational considerations that will be valuable in the operation of our own utility fleet, as well as to customers considering adoption of EVs.” (ComEd Ex. 2.0) What evidence has been produced regarding the hybrid bucket trucks and plug-in electric vehicles that ComEd has already deployed and how have ratepayers benefited from the electric vehicles currently deployed?

A. According to ComEd Response to Staff Data Request JLH 1.12, “ComEd states that it has no internal reports based on the electric vehicles or bucket trucks currently deployed by ComEd.” Considering that ComEd has had a hybrid electric bucket truck deployed since 2006, it undermines the premise of its EV Pilot program that ComEd has not undertaken to analyze the data from its use. These facts do not support ComEd’s position that it is committed to distributing any benefits from information learned to ratepayers, or even that ComEd is committed to the project to gather information.

Q. Are ratepayers paying indirectly for any other EV pilot programs that ComEd is conducting?

A. Yes, ratepayers, through their federal income taxes, and other federal income taxpayers are funding grants that ComEd has received for other electric vehicle pilots. Considering ComEd is planning other EV pilot programs, it is unclear what additional benefits will result from this proposed EV Pilot that will be incremental to the knowledge gained from the other planned pilots that are funded elsewhere.

389 **Q. Has ComEd received any grants for its electric vehicle purchases?**

390 A. Yes. In response to Staff Data Request JLH 1.08c, ComEd states:

391 ComEd currently is party to the following two grants:

392
393 CFDA No.81.086, "Conservation Research and Development" (the
394 "Clean Cities Project"). The grant awards ComEd \$610,000 for
395 vehicles, and \$421,480 for infrastructure. A break out of cost
396 estimates and grant share for vehicles and infrastructure is shown
397 in the attached spreadsheet. Under the terms of the grant, all
398 vehicles and infrastructure are required to be in service by
399 December 31, 2011.

400
401 DOE FOA-0000428, Transportation Electrification Grant. ComEd is
402 partnering with the Electric Power Research Institute (EPRI), the
403 South Coast AQMD, and several other utilities to demonstrate plug-
404 in hybrid (PHEV) vehicles in a commercial fleet application. Under
405 this grant, ComEd will deploy 25 PHEV bucket trucks. Each utility's
406 cost share is the cost of the base vehicle (approximately \$106,000
407 per vehicle, in ComEd's case) while the grant covers the
408 incremental PHEV cost. All vehicles acquired under this grant are
409 expected to be in service by the second quarter, 2011.

410 ComEd points out that the assets purchased from these grants are separate from

411 those that it would purchase under its proposed EV Pilot program. However,

412 ComEd notes that

413 In the event that ComEd receives government funds for investment
414 expenditures related to the EV Pilot, ComEd would apply a
415 proportionate amount of such funds, as appropriate, as a reduction
416 to the Electric Vehicle Plant (EVP).

417 (ComEd Corrected Response to Staff Data Request JLH 1.08d)

418 **IV. Summary of Conclusions**

419 **Q. Please summarize your testimony.**

420 A. It appears that the Electric Vehicle Pilot's budget is inflated. My review suggests
421 reductions of the budget of over twenty percent. This number may be conservative
422 since I do not have access to the same information as a market participant. In
423 addition, it is significant to note that this program is the most transparent of the
424 proposed Alt Reg programs, in terms of the program listing the assets to be
425 purchased and their respective price estimates. It is also true that assets can be
426 verified fairly easily for this program if implemented, unlike other proposed Alt Reg
427 programs. And, to some extent, market prices can be compared to the budgeted
428 prices.

429 With respect to ComEd's concerns about putting EV assets in rate base without an
430 Alt Reg Plan, I note that similar vehicles are now in rate base, and the Company is
431 proposing to make similar additions in its current rate case (Docket No. 10-0467). In
432 my opinion, those facts challenge the legitimacy of ComEd's concerns. Finally,
433 ComEd's proposal has not made a compelling case regarding the net benefits
434 customers are expected to receive from the EV Pilot program.

435 **Q. Does this conclude your direct testimony?**

436 A. Yes.